

Montana Board of Oil and Gas Conservation Environmental Assessment

Operator: Brigham Oil & Gas, L.P.
Well Name/Number: Powers Ranch 20-17 #1-H
Location: NE NE 30 T28N R59E
County: Roosevelt, MT; Field (or Wildcat) Wildcat

Air Quality

(possible concerns)

Long drilling time: No, 30-40 days drilling time.

Unusually deep drilling (high horsepower rig): Triple derrick rig to drill a 20,970' MD/10,332' TVD Bakken Formation single lateral horizontal well test.

Possible H₂S gas production: Slight chance H₂S gas production (Mississippian Formations).

In/near Class I air quality area: No Class I air quality area.

Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under 75-2-211.

Mitigation:

☒ Air quality permit (AQB review)

☐ Gas plants/pipelines available for sour gas

☐ Special equipment/procedures requirements

☐ Other: _____

Comments: If there are existing pipeline for natural gas in the area, associated gas can be must be tied into the gathering system or if no gathering system nearby associated natural gas and/or H₂S gas can be flared under Board Rule 36.22.1220.

Water Quality

(possible concerns)

Salt/oil based mud: Yes to intermediate casing string hole to be drilled with oil based invert drilling fluids. Horizontal lateral will be drilled with brine fluids. Surface casing will be drilled with freshwater and freshwater mud.

High water table: No high water table anticipated.

Surface drainage leads to live water: No, closest drainage is an unnamed ephemeral tributary drainage Shotgun Creek, about 1/4 of a mile to the southwest from this location.

Water well contamination: None, closest water wells in the area are about 1/2 of a mile to the southwest, about 1/2 of a mile to the southeast, about 3/4 of a mile to the southeast, about 7/8 of a mile to the southeast and all other water wells are 1 mile and further away from this location. Depth of these water wells range from 14' to 332'. Surface hole will be drilled with freshwater drilling fluids to about 1850'. Steel surface casing will be run and cemented from 1850' to surface.

Porous/permeable soils: No, sandy silty clay soils.

Class I stream drainage: No, Class I stream drainages nearby.

Mitigation:

☐ Lined reserve pit

☒ Adequate surface casing

☐ Berms/dykes, re-routed drainage

☒ Closed mud system

☒ Off-site disposal of **solids/liquids (in approved facility)**

☒ Other: Cuttings will be trucked to Clean Harbors (Sawyer Landfill, Sawyer, North Dakota

Comments: 1850' surface casing well below freshwater zones in adjacent water wells. Also, covering Fox Hills aquifer. Adequate surface casing and operational BOP equipment will prevent problems formation pressure problems in the well bore.

Soils/Vegetation/Land Use

(possible concerns)

Steam crossings: None anticipated.

High erosion potential: Yes possible erosion problems on moderate cut and fill slopes, location will require a moderate cut of up to 23.7' and moderate fill, up to 14.4', required.

Loss of soil productivity: None, location to be restored after drilling well, if nonproductive. If productive unused portion of wellsite will be reclaimed.

Unusually large wellsite: Yes, very large well site designed as a 1 well pad, 550'X550', for the Powers Ranch 20-17 #1H.

Damage to improvements: Slight, surface use is cultivated land.

Conflict with existing land use/values: Slight

Mitigation

☐ Avoid improvements (topographic tolerance)

☐ Exception location requested

☒ Stockpile topsoil

☐ Stream Crossing Permit (other agency review)

☒ Reclaim unused part of wellsite if productive

☐ Special construction methods to enhance reclamation

☒ Other Requires DEQ General Permit for Storm Water Discharge Associated with Construction Activity, under ARM 17.30.1102(28)

Comments: Will use existing State Highway #2, unnamed county road and existing ranch road. About 200' of new access road will be built into this location off existing west-east ranch road. Cuttings will be trucked to Clean Harbors (Sawyer Landfill, Sawyer, North Dakota). Oil base invert drilling fluids will be recycled. Completion fluids will be removed and hauled to an authorized Class II Disposal. No concerns.

Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Closest residences are about 1 1/16 of a mile to the east southeast and 7/8 of a mile to the south southeast from this location. Town of Bainville, Montana is about 3.9 miles to the southwest from this location.

Possibility of H2S: Slight chance of H2S (Mississippian Formations).

Size of rig/length of drilling time: Triple drilling rig 30 to 40 days drilling time.

Mitigation:

☒ Proper BOP equipment

☐ Topographic sound barriers

☐ H2S contingency and/or evacuation plan

☐ Special equipment/procedures requirements

☐ Other _____

Comments: Adequate surface casing cemented to surface with a working BOP stack should mitigate any problems. (5,000psig annular, pipe and blind rams) equipment (Rule 36.22.1014) to prevent problems. Sufficient distance between location and buildings noise should not be a problem.

Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): None identified.

Proximity to recreation sites: None identified

Creation of new access to wildlife habitat: No

Conflict with game range/refuge management: No

Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Lease Tern, Whooping Crane and Piping Plover. Candidate species is the Sprague's Pipit.

MTFWP Natural Heritage Tracker website indicates three (3) species of concerns. They are the Whooping Crane, Northern Hawk Owl and the Bobolink.

Mitigation:

- ☐ Avoidance (topographic tolerance/exception)
- ☐ Other agency review (DFWP, federal agencies, DSL)
- ☐ Screening/fencing of pits, drillsite
- ☐ Other: _____

Comments: Private cultivated surface lands. There maybe species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. The Board of Oil & Gas has no jurisdiction over private surface lands.

Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites: None identified.

Mitigation

- ☐ avoidance (topographic tolerance, location exception)
- ☐ other agency review (SHPO, DSL, federal agencies)
- ☐ Other: _____

Comments: Surface location is private cultivated land. There maybe possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite. The Board of Oil & Gas has no jurisdiction over private surface lands.

Social/Economic

(possible concerns)

- ☐ Substantial effect on tax base
- ☐ Create demand for new governmental services
- ☐ Population increase or relocation

Comments: Wildcat Bakken Formation horizontal well. No concerns.

Remarks or Special Concerns for this site

No concerns for drilling a 20,970'MD/10,332'TVD Bakken Formation single lateral horizontal well test.

Summary: Evaluation of Impacts and Cumulative effects

Short term impacts expected, no long term impacts anticipated.

I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): /s/Steven Sasaki
(title:) Chief Field Inspector

Date: August 10, 2012

Other Persons Contacted:

Montana Bureau of Mines and Geology, Groundwater Information Center GWIC
website

(Name and Agency)

Roosevelt County water wells

(subject discussed)

August 10, 2012

(date)

US Fish and Wildlife, Region 6 website

(Name and Agency)

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES MONTANA
COUNTIES, Roosevelt County

(subject discussed)

August 10, 2012

(date)

Montana Natural Heritage Program Website (FWP)

(Name and Agency)

Heritage State Rank= S1, S2, S3, T28N R59E

(subject discussed)

August 13, 2012

(date)

If location was inspected before permit approval:

Inspection date: _____

Inspector: _____

Others present during inspection: _____